VERSATILE AXIAL FAN AND CENTRIFUGAL SHUTTER MECHANISM

ABSTRACT

An efficient axial fan (1) has housing (2) with a square inlet opening (3) and a round outlet opening (3"), a fan assembly with a drive motor (10) and a propeller (26p) coupled thereto. The entrance of the housing is provided with a self opening shutter assembly (4) disposed horizontally or vertically across the entrance of the fan and comprising a plurality of vanes (5) including a central operative vane (5c) operated by a centrifugal shutter mechanism (17) secured to one end of the propeller shaft (14), opposite to the propeller (26p) and adjacent to the operative central vane (5c) of the shutter assembly (4). The centrifugal shutter mechanism (17)is normally provided with a hermetic housing (18) comprising a pair of radial masses (22) operatively connected by means of a pair of pivoting arms (23) to an axial sliding reciprocating actuator (24) which is disposed adjacent to the shutter central operative vane (5c). When the fan (1) is on, the radial masses (22) by centrifugal action rotate the pair of arms (23) which push the axial sliding reciprocating actuator(24) away from the central operative vane (5c) allowing an extension spring (7s) associated with the shutter assembly (4) to cause the opening of the vanes 5 and 5c. When the fan (1) is off, an internal compression spring (25) housed within the axial sliding actuator (24) pushes it against the central operative vane (5c) causing the closing of the shutter (4).

The propeller (26p) further comprises a plurality of radially disposed blades (26) which are entirely surrounded by a Venturi (28) and are provided with radially slidably adjustable shoes (26s) for adjusting the tip blade clearance with the Venturi (28).